

Figure 1. Triglyceride content of a *Drosophila minibrain* (GadFly Accession Number CG7826) mutant

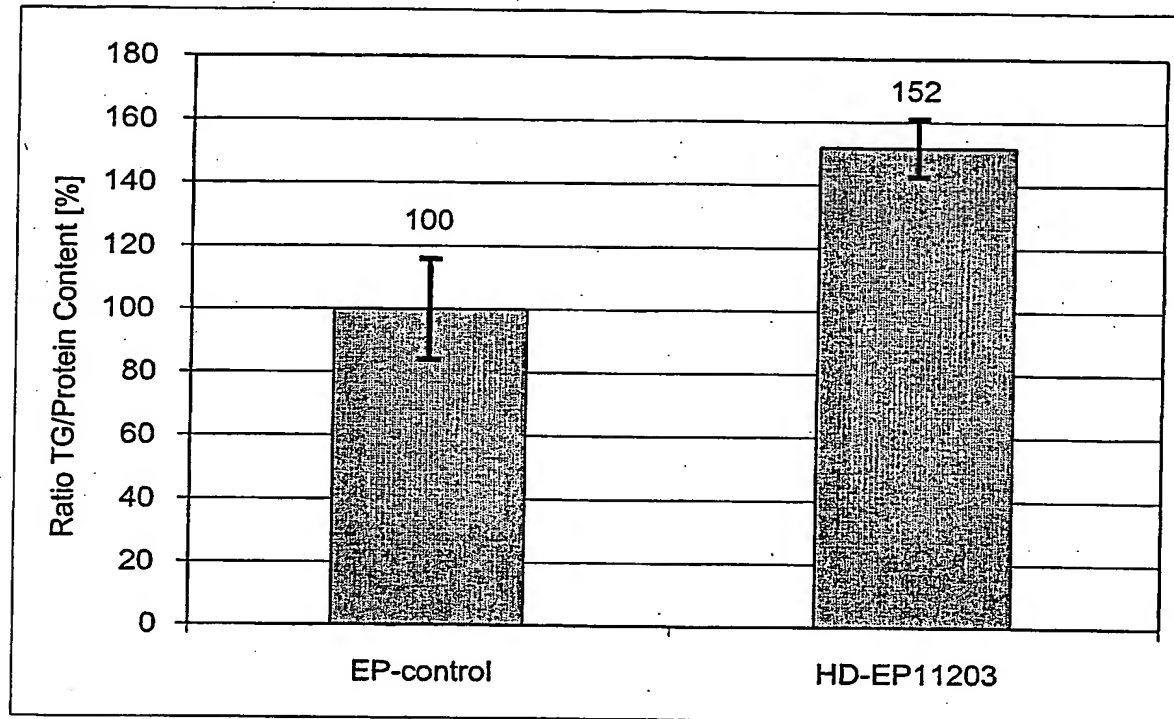


Figure 2. Molecular organization of the *minibrain* gene (GadFly Accession Number CG7826)

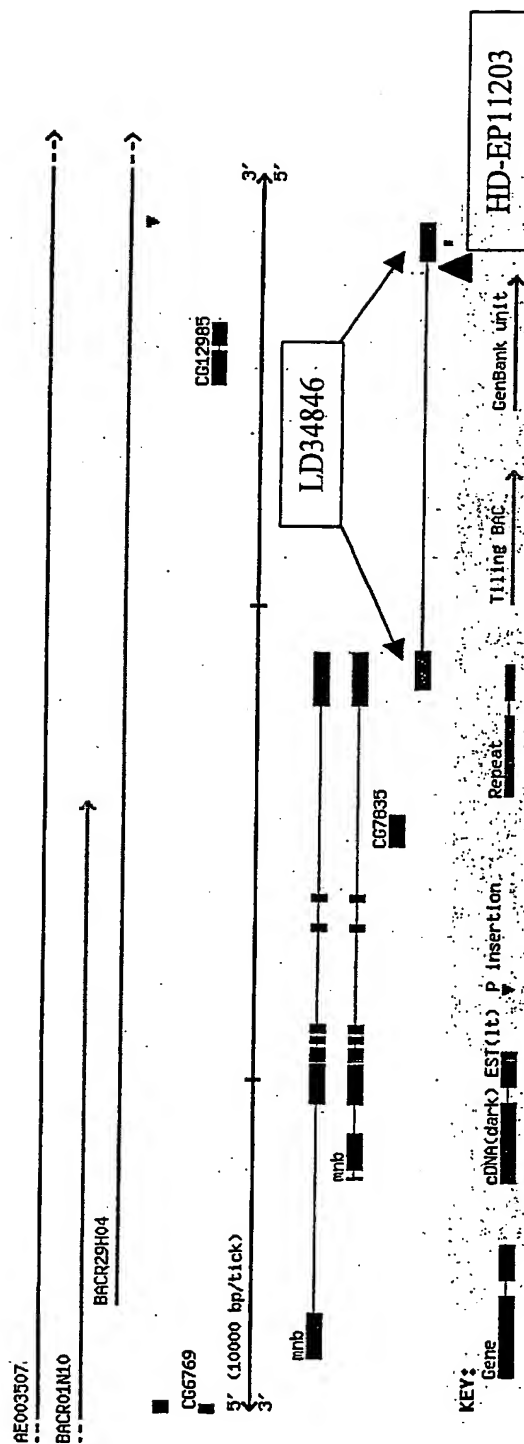


Figure 3. BLASTP results for *minibrain* (GadFly Accession Number CG7826)**Homology to human protein NP_001387.2 (GenBank Accession Number)**

gi|18765758|ref|NP_001387.2| (NM_001396) dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 1A, isoform 1; minibrain (*Drosophila*) homolog; protein kinase minibrain homolog; dual specificity YAK1-related kinase; serine/threonine-specific protein kinase; Length = 763

Score = 689 bits (1779), Expect = 0.0

Identities = 349/424 (82%), Positives = 389/424 (91%), Gaps = 3/424 (0%)

Query: 1 MQARIPNHFREPASGPLRKLSVDLIKTYKHINEVYYAKKKRRAQQQTQGGDDSSNKKERKL 60
+Q R+P FR+PA+ PLRKLSVDLIKTYKHINEVYYAKKKRR QQ QG DDSS+KKERK+
Sbjct: 77 LQRRMPQTRFRDPATAPLRKLSVDLIKTYKHINEVYYAKKKRRHQOGQ-DDSSHKKERKV 135

Query: 61 YNDGYDDDNHDYIIKNGEKFLDRYEIDSLIGKGSFGQVVKAYDHEEQCHVAIKIKNKKP 120
YNDGYDDDN+DYI+KNGEK++DRYEIDSLIGKGSFGQVVKAYD EQ VAIKIIKNKK
Sbjct: 136 YNDGYDDDN+DYI+KNGEKWMDRYEIDSLIGKGSFGQVVKAYDRVEQEWVAIKIKNKKA 195

Query: 121 FLNQAQIEVKLLEMMNRADAENKYYIVKLKRHFMRNHLCLVFELLSYNLYDLLRNTNFR 180
FLNQAQIEV+LLE+MN+ D E KYIIV LKRHF+RNHLCLVFE+LSYNLYDLLRNTNFR
Sbjct: 196 FLNQAQIEVRLLELMNKHDTMKYYIVHLKRHFMRNHLCLVFEMLSYNLYDLLRNTNFR 255

Query: 181 GVSLNLTRKFAQQQLCTALLFLSTPELNIHCDLKPENILLCNPKRSAIKIVDFGSSCQLG 240
GVSLNLTRKFAQQ+CTALLFL+TPEL+IIHCDLKPENILLCNPKRSAIKIVDFGSSCQLG
Sbjct: 256 GVSLNLTRKFAQQMCTALLFLATPELSIIHCDLKPENILLCNPKRSAIKIVDFGSSCQLG 315

Query: 241 QRIYHYIQSRFYRSPEVLLGIQYDLAIDMWSLGCILVEMHTGEPLFSGCNEVDQMKNKIVE 300
QRIY YIQSRFYRSPEVLLG+ YDLAIDMWSLGCILVEMHTGEPLFSG NEVDQMKNKIVE
Sbjct: 316 QRIYQYIQSRFYRSPEVLLGMPYDLAIDMWSLGCILVEMHTGEPLFSGANEVDQMKNKIVE 375

Query: 301 VLGMPPKYLLDQAHKTRKFFDKIVADGSYVLKKNQNG-RKYKPPGSRKLHDILGVETGGP 359
VLG+PP ++LDQA K RKFF+K+ DG++ LKK ++G R+YKPPG+RKLH+ILGVETGGP
Sbjct: 376 VLGIPPAHILDQAPKARKFFEKL-PDGTWNLKTKDKGREYKPPGTRKLHNLGVETGGP 434

Query: 360 GGRRLEDEPGHSVSDYLKFKDLILRMLDFDPKTRVTPYYALQHNFRTADEATNTSGAGA 419
GGRR E GH+V+DYLKFKDLILRMLD+DPKTR+ PYYALQH+FFK+TADE TNTS + +
Sbjct: 435 GGRRAGESGHTVADYLKFKDLILRMLDYPKTRIQPYYALQHSFFKKTADegTNTSNTSVS 494

Query: 420 TANA 423
T+ A
Sbjct: 495 TSPA 498

Homology to human protein AAC28914.1 (GenBank Accession Number)

gi|3399668|gb|AAC28914.1| (AC005393) BC331004_1 [*Homo sapiens*]; Length = 556

Score = 671 bits (1730), Expect = 0.0

Identities = 321/439 (73%), Positives = 370/439 (84%), Gaps = 22/439 (5%)

Query: 4 RIPNHFREPASGPLRKLSVDLIKTYKHINEVYYAKKKRRAQQQTQGGDDSSNKKERKLYND 63
R+P FR+ S PLRKLSVDLIKTYKHINEVYYAKKKRRAQQ DSSNKKK+K+ N
Sbjct: 47 RLPLAFRDATSAPLRKLSVDLIKTYKHINEVYYAKKKRRAQQAP-PQDSSNKKK+KVLNH 105

Query: 64 GYDDDNHDYIIKNGEKFLDRYEIDSLIGKGSFGQVVKAYDHEEQCHVAIKIKNKKPFLN 123
GYDDDNHDYI+++GE++L+RYEIDSLIGKGSFGQVVKAYDH+ Q VAIKIIKNKK FLN

Sbjct: 106 GYDDDNHDYIVRSGERWLERYEIDSLIGKGSFGQVVKAYDHQTQELVAIKIKNKKAFIN 165

Query: 124 QAQIEVKLLEMMNRADAENKYYIVKLKRHFMRNHLCLVFELLSYNLYDLLRNTNFRGVS 183
QAQIE++LLE+MN+ D E KYYIV LKRHFMRNHLCLVFELLSYNLYDLLRNT+FRGVS

Sbjct: 166 QAQIELRLLELMNQHDTEMKYYIVHLKRHFMRNHLCLVFELLSYNLYDLLRNTHFRGVS 225

Query: 184 LNLTRKFAQQLCTALLFLSTPELNIHCDLKPENILLCNPKRSAIKIVDFGSSCQLGQR- 242
LNLTRK AQQLCTALLFL+TPEL+IIHCDLKPENILLCNPKRSAIKIVDFGSSCQLGQR

Sbjct: 226 LNLTRKLAQQLCTALLFLATPELSIIHCDLKPENILLCNPKRSAIKIVDFGSSCQLGQRL 285

Query: 243 -----IYHYIQSRFYRSPEVLLGIQYDLAIDMWSLGCILVEMHTGEP 284
IY YIQSRFYRSPEVLLG YDLAIDMWSLGCILVEMHTGEP

Sbjct: 286 RMEVEGFNFAAALYELPLKIYQYIQSRFYRSPEVLLGTPYDLAIDMWSLGCILVEMHTGEP 345

Query: 285 LFSGCNEVDQMNKIVEVLGMPPKYLLDQAHKTRKFFDKIVADGSYVLKKNQNGRK-YKPP 343
LFSG NEVDQMN+IVEVLG+PP +LDQA K RK+F+++ G + L++ + RK Y+ P

Sbjct: 346 LFSGSNEVDQMNRIVEVLGIPPAAMLDQAPKARKYFERL-PGGGWTLRRTKELRKDYQGP 404

Query: 344 GSRKLHDILGVETGGPGGRRLEDEPGHSVSDYLFKDLILRMLDFDPKTRVTPYYALQHN 403
G+R+L ++LGV+TGGPGGRR EPGHS +DYL+F+DL+LRML+++P R++P ALQH F

Sbjct: 405 GTRRLQEVLGVTGGPGGRRAGEPGHSPADYLRFDLVLRMLEYEPAARISPLGALQHG 464

Query: 404 FKRTADEATNTSGAGATAN 422
F+RTADEATNT AG++A+

Sbjct: 465 FRRTADEATNTGPAGSSAS 483

Homology to human protein AAC28914.1 (GenBank Accession Number)

gi|4758222|ref|NP_004705.1| (NM_004714) dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 1B isoform a; minibrain-related kinase [Homo sapiens]; Length = 629

Score = 659 bits (1700), Expect = 0.0

Identities = 321/420 (76%), Positives = 370/420 (87%), Gaps = 3/420 (0%)

Query: 4 RIPNHFREPASGPLRKLSVDLIKTYKHINEVYAKKKRRAQQTQGDSSNKKERKLYND 63
R+P FR+ S PLRKLSVDLIKTYKHINEVYAKKKRRAQQ DSSNKKE+K+ N

Sbjct: 32 RLPLAFRDATSAPLRKLSVDLIKTYKHINEVYAKKKRRAQQAP-PQDSSNKKKEKKVLNH 90

Query: 64 GYDDDNHDYIIKNGEKFLDRYEIDSLIGKGSFGQVVKAYDHEEQCHVAIKIKNKKPFLN 123
GYDDDNHDYI+++GE++L+RYEIDSLIGKGSFGQVVKAYDH+ Q VAIKIKNKK FLN

Sbjct: 91 GYDDDNHDYIVRSGERWLERYEIDSLIGKGSFGQVVKAYDHQTQELVAIKIKNKKAFIN 150

Query: 124 QAQIEVKLLEMMNRADAENKYYIVKLKRHFMRNHLCLVFELLSYNLYDLLRNTNFRGVS 183
QAQIE++LLE+MN+ D E KYYIV LKRHFMRNHLCLVFELLSYNLYDLLRNT+FRGVS

Sbjct: 151 QAQIELRLLELMNQHDTEMKYYIVHLKRHFMRNHLCLVFELLSYNLYDLLRNTHFRGVS 210

Query: 184 LNLTRKFAQQLCTALLFLSTPELNIHCDLKPENILLCNPKRSAIKIVDFGSSCQLGQRI 243
LNLTRK AQQLCTALLFL+TPEL+IIHCDLKPENILLCNPKRSAIKIVDFGSSCQLGQRI

Sbjct: 211 LNLTRKLAQQLCTALLFLATPELSIIHCDLKPENILLCNPKRSAIKIVDFGSSCQLGQRI 270

Query: 244 YHYIQSRFYRSPEVLLGIQYDLAIDMWSLGCILVEMHTGEPLFSGCNEVDQMNKIVEVLG 303
Y YIQSRFYRSPEVLLG YDLAIDMWSLGCILVEMHTGEPLFSG NEVDQMN+IVEVLG

Sbjct: 271 YQYIQSRFYRSPEVLLGTPYDLAIDMWSLGCILVEMHTGEPLFSGSNEVDQMNRIVEVLG 330

Query: 304 MPPKYLLDQAHKTRKFFDKIVADGSYVLKKNQNGRK-YKPPGSRKLHDILGVETGGPGGR 362
+PP +LDQA K RK+F+++ G + L++ + RK Y+ PG+R+L ++LGV+TGGPGGR

Sbjct: 331 IPPAAMLDQAPKARKYFERL-PGGGWTLRRTKELRKDYQGPGRRLQEVLGVTGGPGGR 389

Query: 363 RLDEPGHSVSDYLFKFDLILRMLDFDPKTRVTPYYALQHNFFKRTADEATNTSGAGATAN 422
R EPGHS +DYL+F+DL+LRML+++P R++P ALQH FF+RTADEATNT AG++A+
Sbjct: 390 RAGEPGHSPADYLRFDLVLRMLEYEPAAARISPLGALQHGFRRRTADEATNTGPAGSSAS 449

Figure 4. Expression of *minibrain* Homologs in Mammalian Tissues

Figure 4A. Real-time PCR analysis of dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 1a (Dyrk1a) expression in wild type mouse tissues

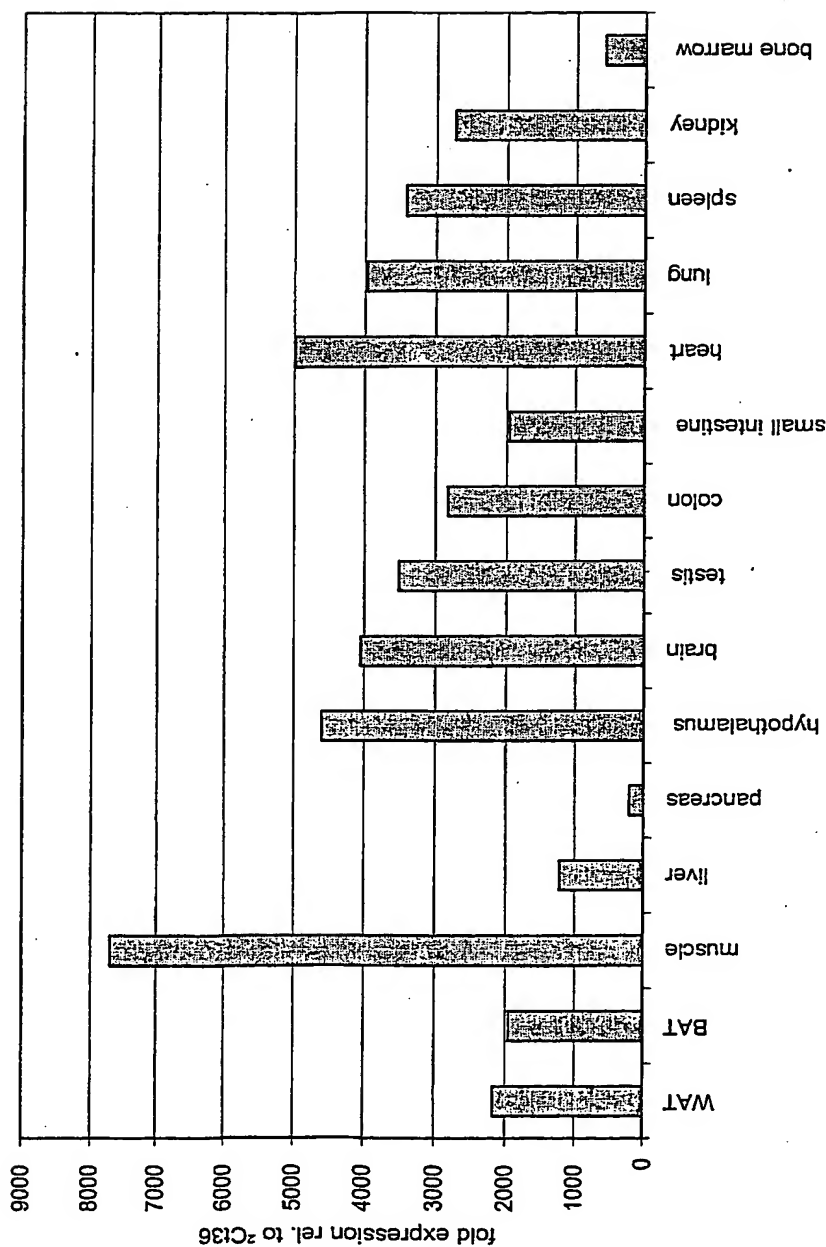


Figure 4B. Real-time PCR analysis of Dyrk1a expression in different mouse models

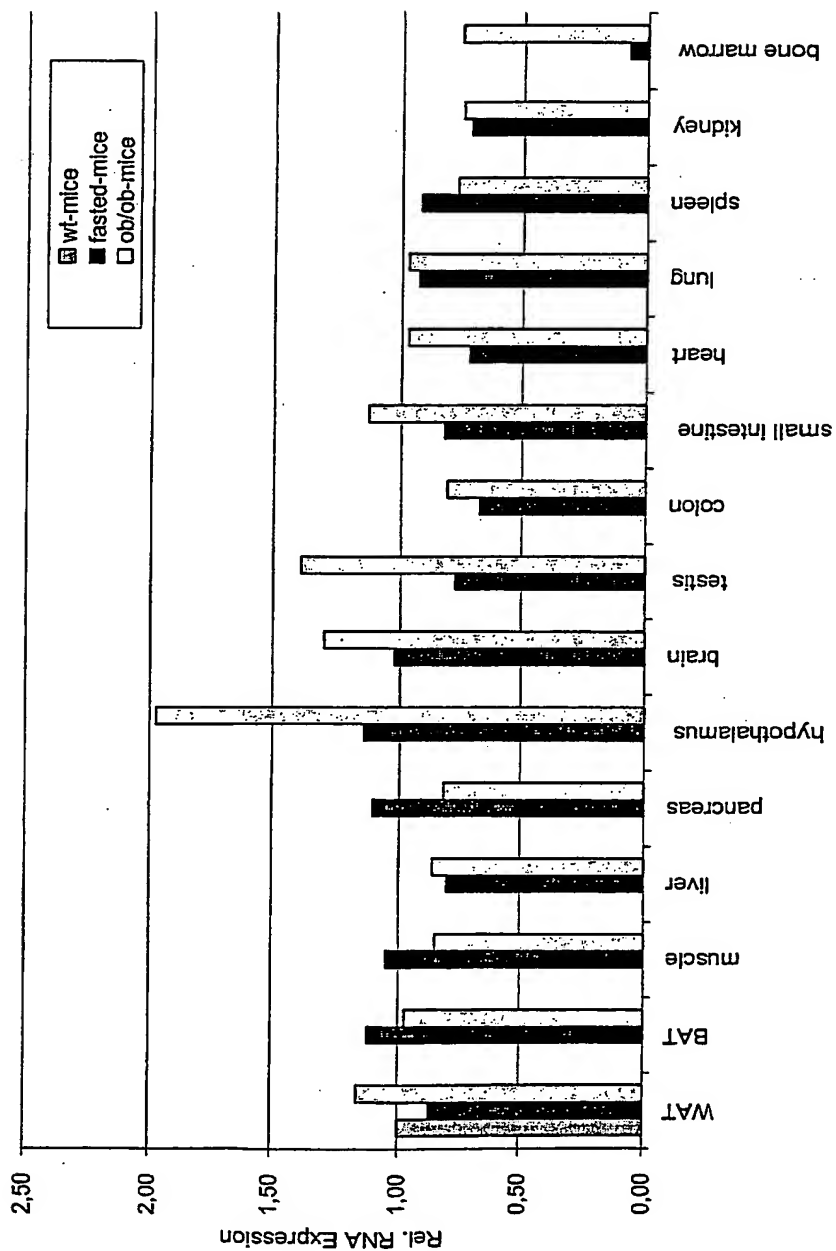


Figure 4C. Real-time PCR analysis of Dyrk1a expression in mice fed with a high fat diet compared to mice fed with a standard diet

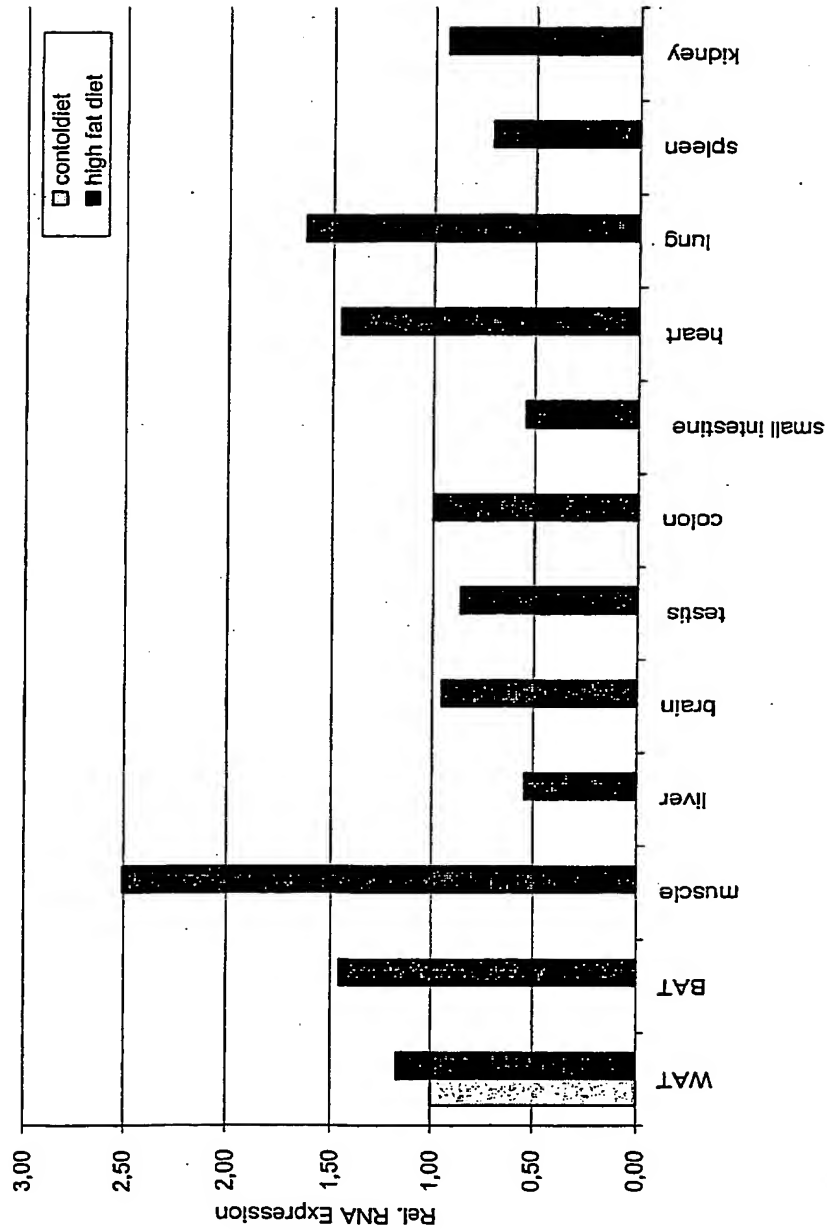


Figure 4D. Real-time PCR analysis of Dyrk1a expression in 3T3-L1 cells differentiated from preadipocytes to mature adipocytes

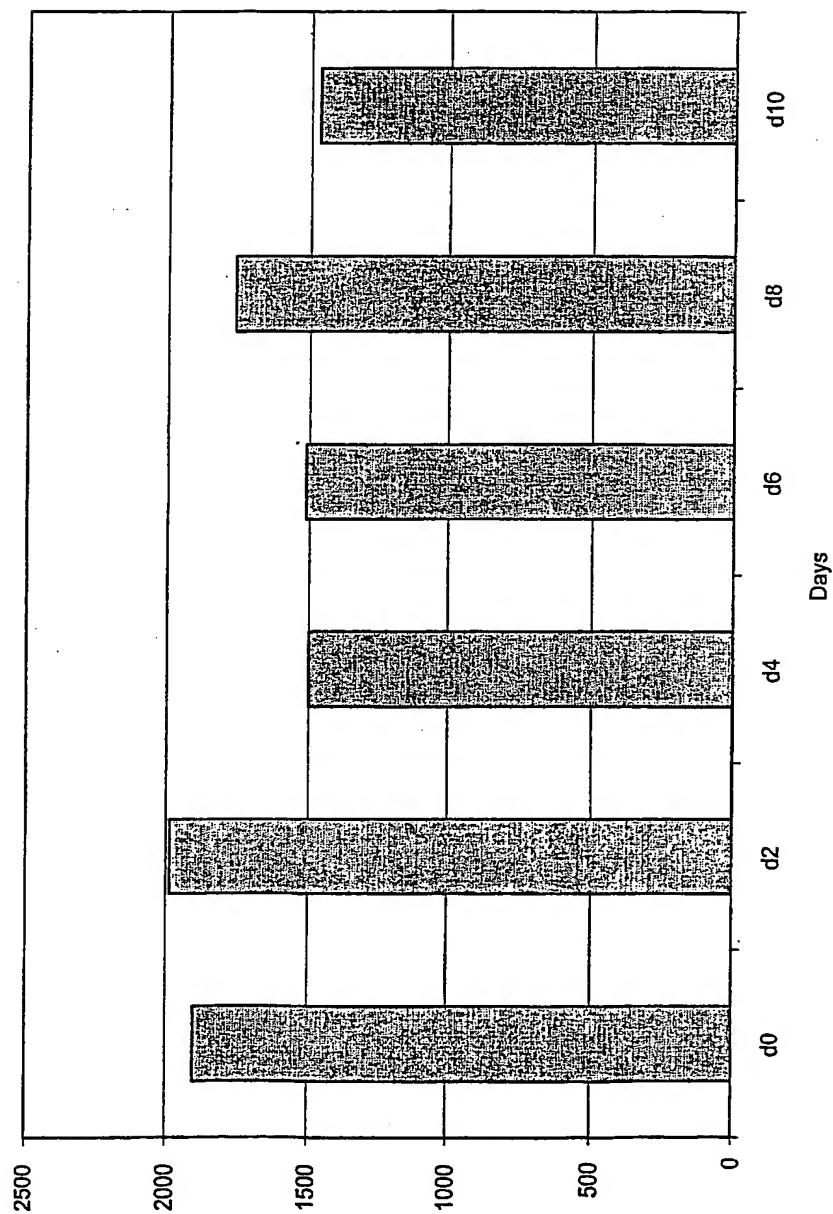


Figure 4E. Real-time PCR analysis of dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 1b (Dyrk1b) expression in wild type mouse tissues

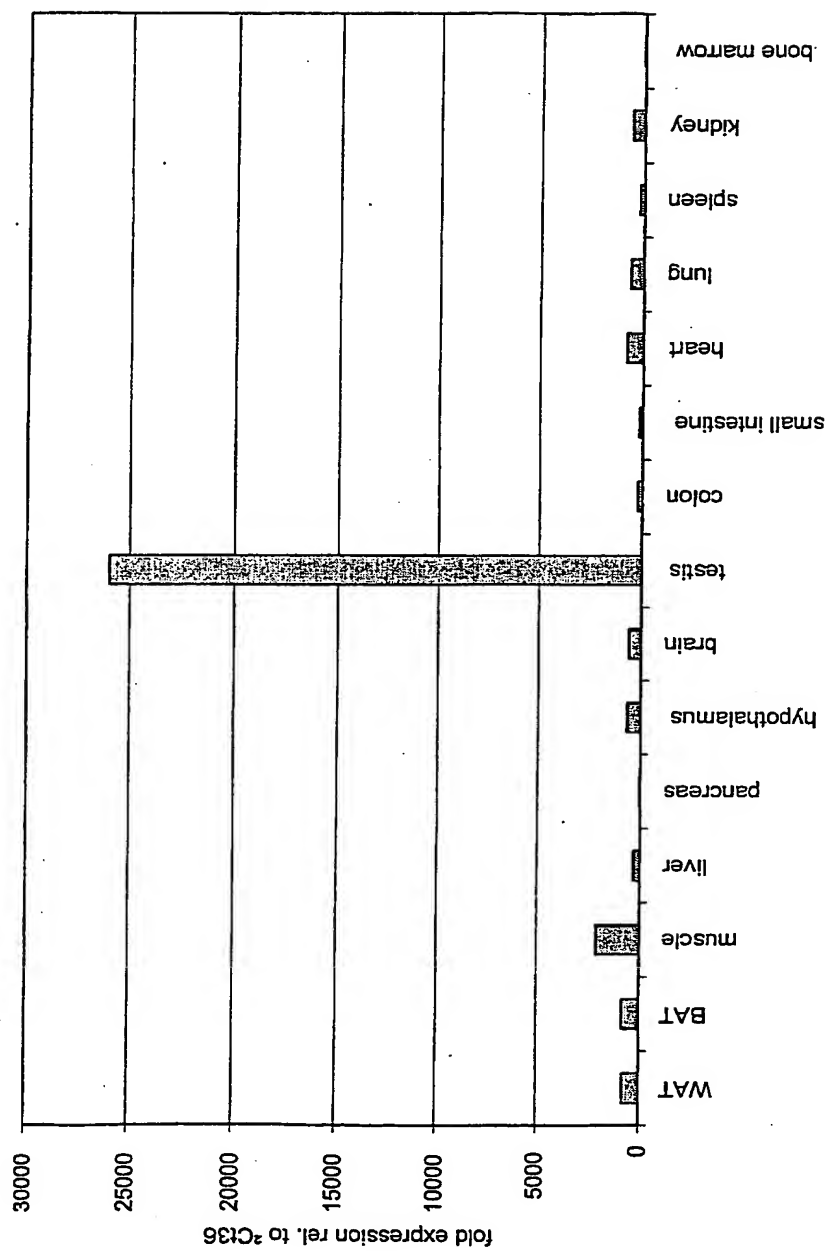


Figure 4F. Real-time PCR analysis of Dyrk1b expression in different mouse models

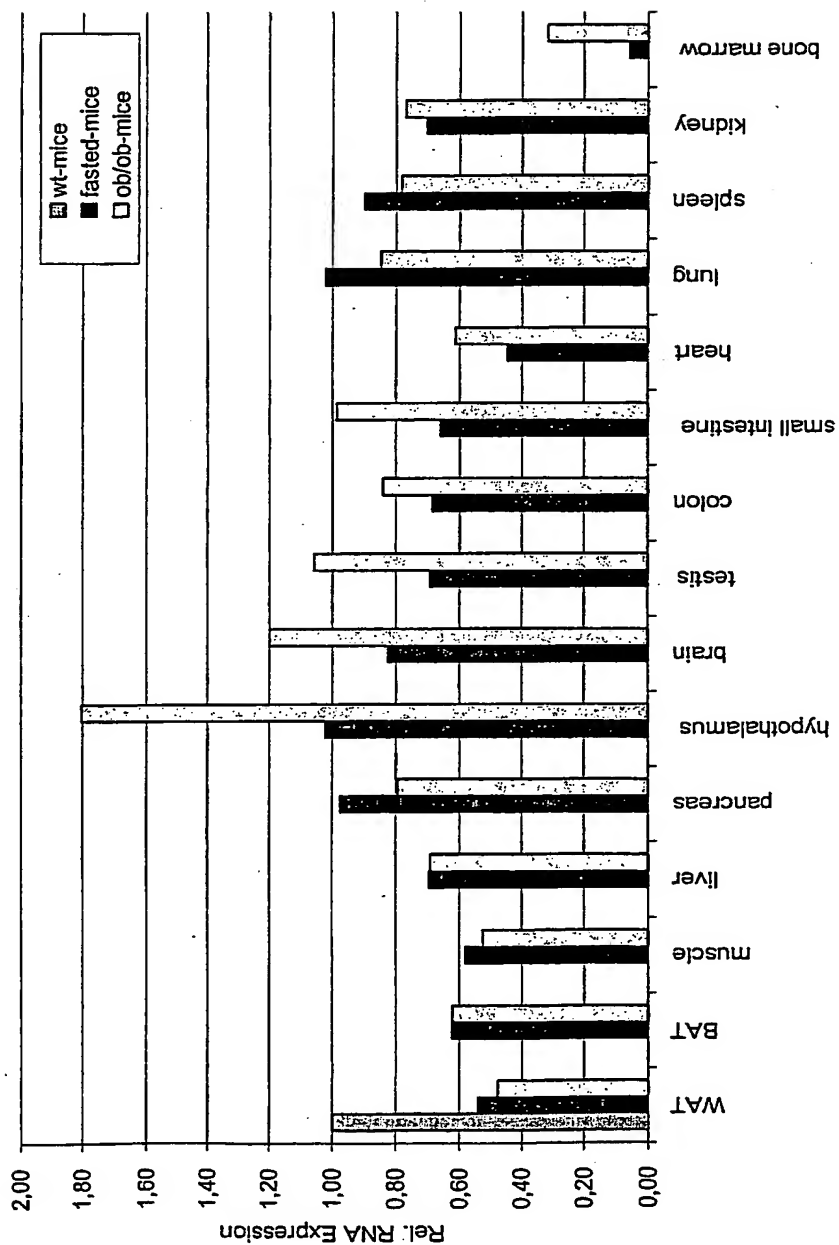


Figure 4G. Real-time PCR analysis of Dyrk1b expression in mice fed with a high fat diet compared to mice fed with a standard diet

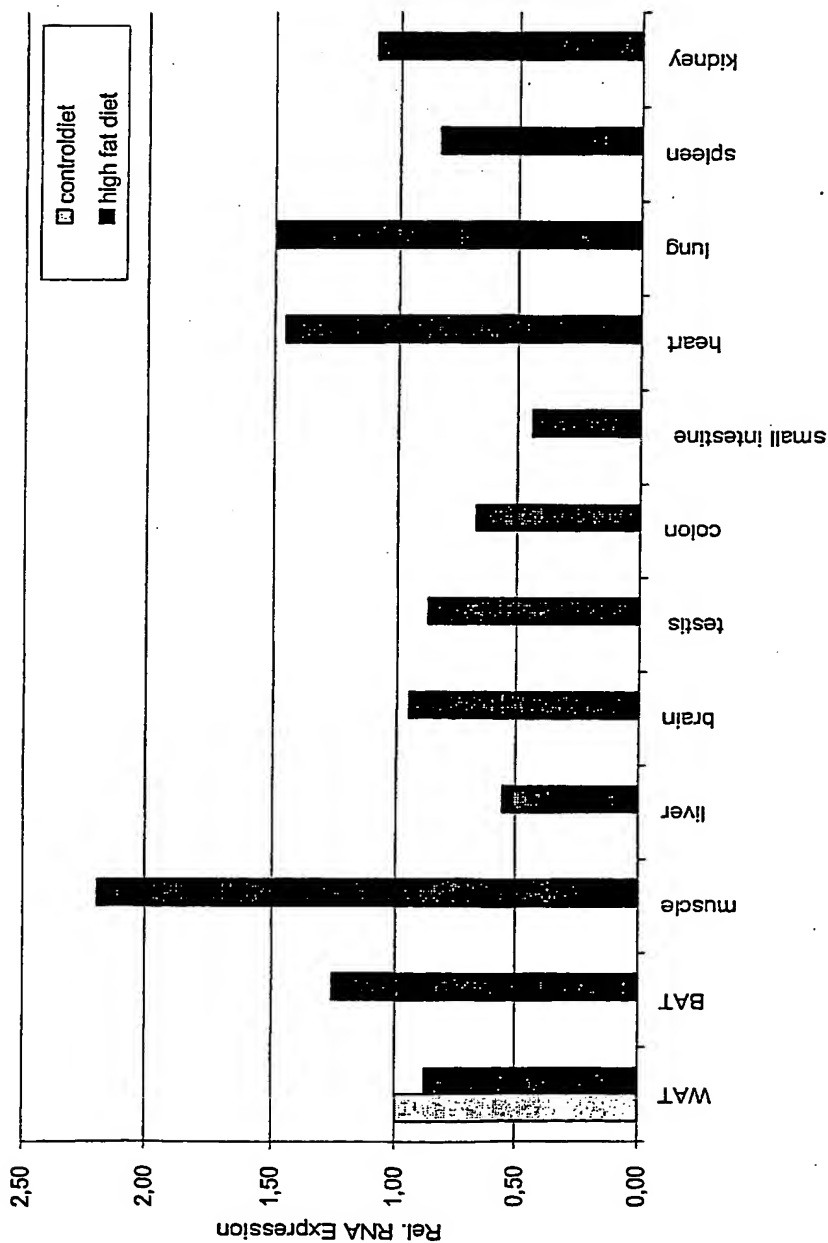


Figure 4H. Real-time PCR analysis of Dyrk1b expression in 3T3-L1 cells differentiated from preadipocytes to mature adipocytes

